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EXAMINER	
FOX, BRYAN J	

ART UNIT	PAPER NUMBER
2686	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/998,964	ARIGA ET AL.	
	Examiner	Art Unit	
	Bryan J Fox	2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-13 and 16-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-13 and 16-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

Applicant is advised that should claim 17 be found allowable, claim 18 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 17 recites the limitation "said first operating mode" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites the limitation "said second operating mode" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "said first operating mode" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "said first operating mode" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 8, 12, 13 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al (US 20030037167A1) in view of Sausta et al (US5034993).

Regarding claim 1, Garcia-Luna-Aceves et al discloses an ad-hoc network 10, which reads on the claimed "network system", including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1), which read on the claimed "terminal communicating with said center via said relay station device". Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "said relay station device has a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second function for communicating with said center via another relay station". Garcia-Luna-Aceves et al fails to disclose choosing an operating mode based upon a communication quantity of the relay station device.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its

resources, a repeater is assigned to that system (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 12, Garcia-Luna-Aceves et al discloses an ad-hoc network 10 including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1), which read on the claimed "terminal". The hosts access the Internet through the network 10 (see page 4, paragraph 43 and figure 1), which reads on the claimed "relay unit relaying communication between a center and a terminal". The Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "said relay station device has a first executing unit executing a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second executing unit executing a second function for communicating with said center via another relay station". Garcia-Luna-Aceves et al fails to disclose choosing an operating mode based upon a communication quantity of the relay station device.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its

resources, a repeater is assigned to that system (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claims 2 and 13, Garcia-Luna-Aceves et al fails to teach switching modes of operation in response to communication quantity.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its resources, a repeater is assigned to that system (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 3, Garcia-Luna-Aceves et al fails to disclose switching modes in response to a communication quantity.

In a similar field of endeavor, Sausta et al discloses that a resource manager 305 allocates or de-allocates resources based upon loading information (see Sausta et al column 3, lines 57-62).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 8, Garcia-Luna-Aceves et al discloses an ad-hoc network 10, which reads on the claimed "network system", including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1). Internet radio 16d reads on the "first relay station device," and Hosts 22A or 22B reads on the claimed "terminal communicating with said center via said first and second relay station devices." Internet Radios 16a and 16b may act as "AirHeads," communicating with a router to the Internet, while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "wherein said first relay station device has a first function for directly communicating with said center and a second function for communicating with said center via another relay station." Garcia-Luna-Aceves et al fails to disclose choosing an operating mode based upon a message indicating mode switching received from a slave station.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its resources, a repeater is assigned to that system based on a request for allocation of more resources (see column 3, lines 15-21). The permanently allocated resources in

that system read on the claimed "threshold," and the request for more resources reads on the claimed "message indicating mode switching received from a slave station," wherein the newly assigned repeater is switching modes when assigned.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 16, Garcia-Luna-Aceves et al discloses an ad-hoc network 10 including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device", and, "relay unit relaying communication between a center and a terminal," and hosts 22A-22C (see page 4, paragraph 43 and figure 1). Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "first executing unit executing a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second executing unit executing a second function for communication with said center via another relay station". Garcia-Luna-Aceves et al fails to disclose choosing an operating mode based upon a message indicating mode switching received from a slave station.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its

resources, a repeater is assigned to that system based on a request for allocation of more resources (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold," and the request for more resources reads on the claimed "message indicating mode switching received from a slave station," wherein the newly assigned repeater is switching modes when assigned.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 17, Garcia-Luna-Aceves et al discloses an ad-hoc network 10 including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device", and, "relay unit relaying communication between a center and a terminal," and hosts 22A-22C (see page 4, paragraph 43 and figure 1). Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "first executing unit executing a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second executing unit executing a second function for communication with said center via another relay station". Garcia-Luna-Aceves et al fails to disclose choosing an operating mode based upon a message indicating mode switching received from a slave station.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its resources, a repeater is assigned to that system based on a request for allocation of more resources (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold," and the request for more resources reads on the claimed "message indicating mode switching received from a slave station," wherein the newly assigned repeater is switching modes when assigned.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 18, Garcia-Luna-Aceves et al discloses an ad-hoc network 10 including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device", and, "relay unit relaying communication between a center and a terminal," and hosts 22A-22C (see page 4, paragraph 43 and figure 1). Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "first executing unit executing a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second executing unit executing a second function for communication with said center via another relay station". Garcia-Luna-Aceves et al fails to disclose choosing an

operating mode based upon a message indicating mode switching received from a slave station.

In a similar field of endeavor, Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its resources, a repeater is assigned to that system based on a request for allocation of more resources (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold," and the request for more resources reads on the claimed "message indicating mode switching received from a slave station," wherein the newly assigned repeater is switching modes when assigned.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Ramanathan (US005850592A).

Regarding claim 4, Garcia-Luna-Aceves et al discloses an ad-hoc network 10, which reads on the claimed "network system", including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1), which read on the claimed "terminal communicating with said center via said relay station device". Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the

Internet, which reads on the claimed "said relay station device has a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second function for communicating with said center via another relay station," and, "wherein one of a first operating mode for executing said first function and a second operating mode for executing said second function is set to said relay station device." Garcia-Luna-Aceves et al fails to expressly disclose outputting a communication stop signal when the relay station device cannot communicate with a host station, and the host station outputting a recovery signal when the relay station is communicable with the host station, and selecting the mode of operation based on one of these signals.

In a similar field of endeavor, Ramanathan discloses a communication network employing a plurality of similar mobile stations, some of which are operating as cluster gateways and some of which are operating as non-gateway, or cluster member stations (see column 3, lines 1-13 and figure 1). The cluster gateway mode of operation reads on the claimed "first operating mode for executing said first function" and the non-gateway or cluster member mode reads on the claimed "second operating mode for executing said second function". A station first attempts to affiliate with an existing cluster gateway station, and, if successful, operates as a cluster member (see column 3, lines 41-50 and figure 2). However, if the station cannot connect to an existing cluster gateway station, the station enters operation as a cluster gateway (see column 4, lines 8-19 and figure 2), which reads on the claimed "said relay station device cannot

communicate with a host station including said another relay station, said relay station device is set to said first operating mode". Periodically, each gateway station tests its proximity conditions to other gateway stations, e.g., by signal strength measurements or using other data available through the exchanging of messages by the cluster gateway stations which make up the network background and if the test indicates that the proximity conditions are exceeded, i.e., that the particular station's operation as a gateway is possibly redundant and/or unnecessary, the station executes a resignation procedure (see column 4, lines 30-46). This resignation is broadcasted and a confirmation is received from all neighbor CGS and all CM's (see figure 5), satisfying the limitation of "wherein when said host station can communicate with said relay station device, said host station outputs to said center a recovery declaration signal indicating that said host station can communicate with said relay station device, and wherein said center outputs to said relay station device a recovery notification signal indicating that said host station is communicable based on said communication stop signal and said recovery declaration signal, and wherein said relay station device is switched from said first operating mode to said second operation mode in response to said recovery notification signal."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al to include the above mode switching as disclosed by Ramanathan in order to provide a network which posses the ability to adaptively reorganize in the face of movement or destruction and that is highly reliable

and simple and inexpensive to construct as suggested by Ramanathan (see column 1, lines 50-56).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Hill et al (US006381467B1).

Regarding claim 7, Garcia-Luna-Aceves et al discloses an ad-hoc network 10, which reads on the claimed "network system", including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1). Internet radio 16d reads on the "first relay station device," and IR 16C reads on the "second relay station device provided between said center and said first relay station device," and Hosts 22A or 22B reads on the claimed "terminal communicating with said center via said first and second relay station devices." Internet Radios 16a and 16b may act as "AirHeads," communicating with a router to the Internet, while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "wherein said first relay station device has a first function for directly communicating with said center and a second function for communicating with said center via said second relay station device and another relay station." Garcia-Luna-Aceves et al fails to disclose choosing an operating mode based upon a communication quantity of the relay station device.

In a similar field of endeavor, Hill et al discloses a system where a master recognizes a need for assistance in managing the ad hoc wireless network in response

to experiencing a traffic level exceeding a predetermined threshold and negotiates with a member of the ad hoc wireless network for the member to become a sub-master (see column 1, line 65 – column 2, line 65). The negotiation in response to a traffic threshold reads on the claimed "said second relay station transmits to said first relay station device a communication quantity data indicating a communication quantity in said second relay station device, and wherein said first relay station device is set to one of a first operating mode for executing said first function and a second operating mode for executing said second function based on said communication quantity data."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Hill et al to include the above change in mode in response to communication quantity in order to better balance the load and system resources.

Claims 9, 11, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Sausta et al, as applied to claims 1 and 12 above, and further in view of Totaro et al (US006137885A).

Regarding claims 9 and 19, the combination of Garcia-Luna-Aceves et al and Sausta et al discloses that internet radios 16a and 16b are connected to the Internet via LAN 20 (see figure 1), which reads on the claimed "mobile communication network line is used for communication between said another relay station and said center". The combination of Garcia-Luna-Aceves et al and Sausta et al fails to disclose direct communication between terminals.

In a similar field of endeavor, Totaro et al discloses a system that allows a direct encrypted radio telephone link between two terminals of a mobile radio network (see column 2, lines 66-67 and figure 1) where the direct radio link is facilitated by the terminal (see column 3, lines 14-43 and figure 3), which reads on the claimed "communication between said relay station device and said terminal is made through direct communication between terminals".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Garcia-Luna-Aceves et al and Sausta et al with Totaro et al to include the above direct link between terminals in order to conserve system resources.

Regarding claims 11 and 20, the combination of Garcia-Luna-Aceves et al and Sausta et al discloses that internet radios 16a and 16b are connected to the Internet via LAN 20 (see Garcia-Luna-Aceves et al figure 1), which reads on the claimed "mobile communication network line is used for communication between said another relay station and said center". The combination of Garcia-Luna-Aceves et al and Sausta et al fails to disclose direct communication between terminals.

Totaro et al discloses a system that allows a direct encrypted radio telephone link between two terminals of a mobile radio network (see column 2, lines 66-67 and figure 1) where the direct radio link is facilitated by the terminal (see column 3, lines 14-43 and figure 3), which reads on the claimed "communication between said relay station device and said terminal is made through direct communication between terminals".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Garcia-Luna-Aceves et al and Sausta et al with Totaro et al to include the above direct link between terminals in order to conserve system resources.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Hill et al as applied to claim 7 above, and further in view of Totaro et al.

Regarding claim 10, the combination of Garcia-Luna-Aceves et al and Sausta et al discloses that internet radios 16a and 16b are connected to the Internet via LAN 20 (see figure 1), which reads on the claimed "mobile communication network line is used for communication between said another relay station and said center". The combination of Garcia-Luna-Aceves et al and Hill et al fails to disclose direct communication between terminals.

In a similar field of endeavor, Totaro et al discloses a system that allows a direct encrypted radio telephone link between two terminals of a mobile radio network (see column 2, lines 66-67 and figure 1) where the direct radio link is facilitated by the terminal (see column 3, lines 14-43 and figure 3), which reads on the claimed "communication between said relay station device and said terminal is made through direct communication between terminals".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Garcia-Luna-Aceves et al and Hill et al with

Totaro et al to include the above direct link between terminals in order to conserve system resources.

Response to Arguments

Applicant's arguments with respect to claims 1-4, 7-13 and 16-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan J Fox whose telephone number is (703) 305-8994. The examiner can normally be reached on Monday through Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CHARLES APPIAH
PRIMARY EXAMINER

BJF